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DEPARTMENT OF THE ARMY 08800.TD  
CORPS OF ENGINEERS, TULSA DISTRICT JAN 97  
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TULSA DISTRICT GUIDE SPECIFICATION

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SECTION 08800

TRANSLUCENT INSULATED PANELS

1 GENERAL

1.1 SUMMARY

Translucent panels shall consist of double faced sandwich panels consisting of inner and outer fiberglass sheets with insulation between and a fiberglass or aluminum grid system.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

|             |  |
|-------------|--|
| ASTM A 36   | (1994) Structural Steel  |
| ASTM B 209  | (1995) Aluminum and Aluminum-Alloy Sheet and Plate   |
| ASTM B 221  | (1995a) Aluminum-Alloy Extruded Bar, Rod-Wire, Shape and Tube  |
| ASTM C 236  | (1989; R 1993) Steady-State Thermal Performance of Building Assemblies by Means of Guarded Hot Box           |
| ASTM C 297  | (1994) Tension Test of Flat Sandwich Construction in Flatwise Plane  |
| ASTM D 635  | (1991) Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastic in a Horizontal Position |
| ASTM D 1002 | (1994) Strength Properties of Adhesives in Shear by Tension Loading (Metal-to-Metal)                         |
| ASTM D 1037 | (1993) Evaluating and Properties of Wood-Base Fiber and Particle Panel Materials                             |
| ASTM D 1183 | (1992) Resistance of Adhesives to Cyclic Laboratory Aging Conditions   |
| ASTM D 1435 | (1994) Outdoor Weathering of Plastics  |
| ASTM D 2244 | (1993) Calculations of Color Differences from Instrumentally Measured Color Coordinates                      |

|             |  |
|-------------|--|
| ASTM D 3841 | (1992) Glass Fiber-Reinforced Polyester Plastic Panels           |
| ASTM E 72   | (1995) Conducting Strength Test Panels for Building Construction |
| ASTM E 84   | (1995a) Surface Burning Characteristics of Building Materials    |

### 1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL DESCRIPTIONS:

#### SD-04 Drawings

Translucent Insulated Panels; [\_\_\_\_\_].

Submit shop drawings and color samples for approval.

#### SD-09 Reports

Translucent Insulated Panels; [\_\_\_\_\_].

The manufacturer shall submit certified test reports made by an independent testing organization for the panel system proposed for use. Reports shall verify that the material will meet all performance requirements of this specification. Previously completed test reports will be acceptable if current and indicative of products used on this project. Test reports shall include:

Outdoor Weathering (ASTM D 1435)

Flame Spread and Smoke Development (ASTM E 84) Burn Extent (ASTM D 635)

Color Difference (ASTM D 2244) Impact Strength (SPI Method) Bond Strength

(ASTM C 297 and ASTM D 1002) Accelerated Aging (ASTM D 1037) Beam Bending

Strength (ASTM E 72) Insulation "U" Factor (ASTM C 236)

#### SD-13 Certificates

Translucent Insulated Panels; [\_\_\_\_\_].

Submit calculations to show panels have been designed for openings, wind loading, and pressures. Calculations shall be performed by a registered engineer.

### 1.4 QUALITY ASSURANCE

#### 1.4.1 Manufacturer's and Erector's Qualifications

##### 1.4.1.1 Known Manufacturer

Kalwall Corporation, Manchester, NY.; Cemcel Corporation, Dallas, TX.; or Skywall, Inc., Chattanooga, TN.

##### 1.4.1.2 Panel system

Panel system shall be listed by a recognized building code authority (such as the International Conference of Building Officials or Southern Building Code Congress) or Underwriters Laboratory.

#### 1.4.2 Materials and Products

Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of similar materials for a period of at least 5 consecutive years and which can show evidence of these materials being satisfactorily used on at least six projects of similar size, scope and type within such a period. At least three of the projects shall have been in successful use for 5 years or longer.

#### 1.4.3 Erection of Materials

Erection shall be by an installer which has been in the business of erecting similar materials for at least five consecutive years, and can show evidence of satisfactory completion of projects of similar size and scope.

#### 1.4.4 Performance Requirements

The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.

### 1.5 PRODUCT HANDLING

Store translucent panels on the long edge several inches above the ground, blocked and under cover to prevent warping.

## 2 - MATERIALS

### 2.1 TRANSLUCENT FACING

#### 2.1.1 Face Sheets

Exterior face sheets shall be min. 1.8 mm 0.070 inch thick fiberglass panels, color as shown or selected. Interior face sheets shall be min. 1.1 mm 0.045 inch thick fiberglass panels, color as shown or selected. Faces shall not vary more than 10% in thickness. Wall panels shall be flat panels [and barrel vault skylight shall be curved panels and frames or a series of flat panels. Skylights shall be self framing or with supplemental framing as necessary as designed and provided by the manufacturer. Flat panel skylights shall consist of a minimum of eight segments or flat panel sections from side to side].

#### 2.1.2 Flammability

The interior face sheet shall have a flame spread rating no greater than 25 and smoke development no greater than 450 when tested in accordance with ASTM E 84 and shall be U.L. listed. Burn extent by ASTM D 635 shall be no greater than 25 mm 1 inch.

#### 2.1.3 Weatherability

##### 2.1.3.1 Degradation

Overall degradation factor shall be 10 or less according to ASTM D 3841.

##### 2.1.3.2 Color Retention

The exterior faces shall meet the color retention requirements of either of the following:

a. The exterior faces shall not darken change color more than 4 units (Delta E by ASTM D 2244) after 5 years of outdoor weathering in accordance with ASTM D 1435.

or

b. The exterior faces shall not change color more than 3.0 Units (DELTA E by ASTM D-2244) after 5 years outdoor weathering South Florida at 7 degrees facing South determined by the average of at least three white samples, and an exterior white face sheet shall not darken more than 0.2 Units (DELTA L by ASTM D-2244) when exposed to 66 degrees C 150 degrees F for 2 weeks.

#### 2.1.3.3 Protective Surfaces

The exterior faces shall have a special protective surface for maximum resistance to erosion and weather, applied in the factory under controlled temperature conditions.

#### 2.1.4 Appearance

The faces shall be uniform in color to prevent splotchy appearance. Faces shall be completely free of ridges and wrinkles which prevent proper surface contact in bonding to the aluminum grid core. Clusters of air bubbles which collect moisture and dirt will not be acceptable.

#### 2.1.5 Strength

The exterior face sheet shall be uniform in strength and repel an impact equal to 60 ft. lbs. in accordance with SPI Shatter Resistance Test without fracture or tear.

### 2.2 NON-COMBUSTIBLE GRID CORE

#### 2.2.1 Aluminum I-Beams

The I-beams shall aluminum and shall have provisions for mechanical interlocking of muntin, mullion and perimeter to prevent high and low intersections which do not allow full bonding surface to contact with face materials. Width of I-beam shall be no less than 11 mm 7/16 inch. Aluminum I-beam for the grid shall be machined to tolerances of not greater than .05 mm .002 inch for flat panels. A welded or web interlocked grid core shall not be acceptable due to unevenness at muntin-mullion intersections.

#### 2.2.2 Fiberglass Grid Core

Fiberglass grid core shall be of similar stock as face sheets, minimum 2.3 mm .090 inch thickness, white [ ] in color.

### 2.3 ADHESIVE

The laminate adhesive shall be heat and pressure type engineered for structural sandwich panel use. Minimum strength shall be:

53 kg/sq. cm 750 PSI tensile strength by ASTM C 297 after two exposures to six cycles each of the aging conditions prescribed by ASTM D 1037.

35 kg/sq. cm 500 PSI shear strength average of all five following separate exposures by ASTM D 1002:

50% relative humidity at 23 degrees C 73 degrees F. Accelerated aging by ASTM D 1183 83 degrees C. 182 degrees F. Full Cycle Soak 500 Hour Oxygen Bomb

## 2.4 PANEL

### 2.4.1 General Construction Requirements

Panels shall have a thickness of 70 mm 2-3/4 inches with a max. "U" factor of [0.24] [\_\_\_\_\_] max. light transmission of [15%] [\_\_\_\_\_] and shading coefficient of not more than [0.27] [\_\_\_\_\_]. Translucent panels shall be a true sandwich panel of flat fiberglass sheets bonded to a grid core of interlocking aluminum I-beams laminated under a controlled process of heat and pressure or a grid core of fiberglass laminated to face sheets by chemical and mechanical processes. Translucent sandwich panels shall be pre-assembled and sealed at the factory. Panels shall be shipped to the job site in rugged shipping units and shall be ready for erection as units (except for removable components) by contractor. Field assembly of major components will not be allowed.

### 2.4.2 Panel Deflection

Translucent sandwich panel deflection shall not exceed 70 mm at 2.5 kg/sq. cm 3.5 inches at 35 PSI loading and shall not exceed 2.5 mm 0.10 inch set deflection five minutes after load release when tested in accordance with ASTM E 72 with a 3600 mm 12 foot clear span tested flat.

### 2.4.3 Grid Patterns

All grid patterns shall be manufacturer standard and be symmetrical about the horizontal centerline of each panel. Flat panel width shall be 1500 mm 5 feet.

### 2.4.4 Adhesive Bonding Line

The adhesive bonding line shall be straight over the entire width of the I-beam and have a neat, sharp edge. In order to insure bonding strength. white spots at intersections of muntins and mullions shall not exceed 4 for each 3.7 square meters 40 square feet of panel, nor shall they be more than 1.2 mm 3/64 inch in width

### 2.4.5 Windloading

Windloading for each wall shall be not less than:

|            |                  |        |           |                  |        |
|------------|------------------|--------|-----------|------------------|--------|
| North wall | 303 kg/sq. meter | 62 PSF | East wall | 122 kg/sq. meter | 25 PSF |
| South wall | 171 kg/sq. meter | 35 PSF | West wall | 122 kg/sq. meter | 25 PSF |

### 2.4.6 Horizontal Wind Bracing

Provide horizontal wind bracing at midpoint on north elevation.

### 2.4.7 Curved Panels

Curved panels and aluminum perimeter frame shall be pre-assembled where practical and sealed at the factory. Panels shall be shipped to the job site in unit ready for erection.

## 2.5 BATTENS AND PERIMETER CLOSURE SYSTEM

All battens and perimeter closures shall be aluminum supplied with #410 Type A. stainless steel screws excluding final fasteners to the building. (e.g.. powder driven fasteners, lagbolts). Perimeter closure for curved panels shall be factory sealed to the panels and aluminum battens and cap plates shall be field installed. Receiving channels for self-tapping stainless

steel screws shall be continuous the length of each member and extruded as part of the member.

## 2.6 FLEXIBLE SEALING TAPE

Sealing tape shall be manufacturer's standard preapplied to closure system at the factory under controlled conditions.

## 2.7 ALUMINUM

ASTM B 221, 6063-T6 or 6063-T5 alloy. Exposed aluminum shall be mill finish, unless otherwise shown or specified, color as shown.

## 3 EXECUTION

### 3.1 PREPARATION

The Contractor shall protect dissimilar materials from aluminum system which may cause damage by electrolysis in accordance with Section: Miscellaneous Metals.

### 3.2 ERECTION

Translucent panel system shall be erected in accordance with the manufacturer's written instructions. Fastening and sealing shall be in accordance with manufacturer's shop drawings. Joints between panels and between panels and other surfaces shall receive backing filler and sealant as recommended by the manufacturer. Aluminum shall be cleaned before sealants are applied.

--End of Section--